

**REMARKS**

Applicants have canceled claim 4-6 and 27 without prejudice or disclaimer to the subject matter recited therein, and expressly reserve all rights to such subject matter. Applicants have also amended claims 1-3, 7-14, 16-26 and 28-29 and added new claims 30-57 directed to matter supported by the claims prior to the claim amendments of this response. In addition, claim 3 has been amended to delete "straw" and add "straw," which is supported by the specification at page 9, line 12-18. Claim 25 has also been amended to recite skin "or membrane" lesions, which is supported by the Specification at page 14, lines 19-26. No new matter has been added. Upon entry of this amendment, claims 1-3, 7-26 and 28-57 will be pending.

***The claims are properly dependent***

Claims 4-16 and 20-29 were objected to under 37 C.F.R. §1.75(c) as being improper. In addition, the Examiner points out that claim 16 is additionally improper because it depends from several sets of claims simultaneously. Applicants have amended claims 7, 9, 12, 16, 22 24 to depend from claim 1; claim 20 to depend from claim 18; claim 21 to depend from claims 16 or 17 and claims 25 and 29 to depend from claim 12 or 21. Accordingly, the claims are properly dependent.

***The claims particularly point and distinctly claim the subject matter***

Claims 1-29 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject which applicant regards as the invention.

Applicants have made various claim amendments to conform the pending claims to U.S. practice, including making clear the dependencies of each claim.

Claims 1, 2, 4-6, 8, 11, 22 and 28 were amended to delete "supplement."  
Claims 1-3, 6-8, 11, 18, 20, 22, 24-26 and 28-29 were amended to delete "e.g." and "for example."

The cancellation of claim 6 renders the rejection of claim 6 moot.

Claims 10 and 11 were amended to recite "molecular" oxygen. Applicants respectfully submit that one of ordinary skill in the art would know that oxygen in this context means gaseous molecular oxygen. See, e.g., Specification at page 12, lines 7-13, which discloses "exposure to oxygen (e.g., the oxygen in ambient air). Claim 10 now recites a material substantially free of molecular oxygen. Further, claim 11 now recites a material that is "self-gelling on the exposure to molecular oxygen." Accordingly, claims 10 and 11 are definite.

Claim 13 was amended to delete the recitation of "consisting essentially of."

Claim 17 has been amended to recite the process steps of providing oxygen to the material, providing water to the material, providing oxidase substrate to the material and/or activating one or more of the redox enzymes.

Claims 21 and 23 were amended to delete the recitation of "or obtainable by."

For the reasons above, Applicants respectfully request that the rejections of claims 1-29 under 35 U.S.C. §112, second paragraph, be reconsidered and withdrawn.

***The claims are not anticipated by the prior art***

Claims 1-14, 16-23 and 27-29 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,108,765 to Maatt *et al.* ("Maat") in light of Chemical Abstracts 79(5):30641 (1973) by Geissman *et al.* ("Geissman") for the reasons stated on pages 5-6 of the Office Action. Applicants respectfully traverse.

In order to reject a claim under 35 USC § 102, the Examiner must demonstrate that each and every claim term is contained in a single prior art reference. See *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986); see also MPEP § 2131 (Rev. 1, February 2000).

Claim terms are to be given their plain meaning as understood by the person of ordinary skill in the art, particularly given the limitations of the English language, and claims are to be given their broadest reasonable interpretation consistent with Applicants' specification. Not only must the claim terms, as reasonably interpreted, be present, an allegedly anticipatory reference must enable the person of ordinary skill to practice the invention as claimed. Otherwise, the invention cannot be said to have been already within the public's possession, which is required for anticipation. See *Akzo, N.V. v. U.S.I.T.C.*, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986); *In re Brown*, 141 USPQ 245, 249 (CCPA 1964).

First, Applicants respectfully submit that this rejection is improper because the Examiner relies on two (2) references to assert anticipation. However, the proper standard for making an anticipation rejection under 35 U.S.C. §102 is that each and every claim term is contained in a ***single*** prior art reference, not more than one prior art reference.

Although this rejection is procedural improper, the claims are not anticipated

by Maat or Geissman. The present invention is directed to a water soluble hemicellulose material comprising non-cellulosic, non-starch plant polysaccharide, wherein the polysaccharide comprises arabinoxylan ferulate; an oxidase and an oxidase substrate. See, e.g., Specification at page page 6, lines 2-4 and 12-14; page 9, lines 4-7; and page 11, lines 21-25.

To the contrary, Maat discloses a flour composition that is neither water soluble nor non-cellulosic and non-starch. Indeed, one of ordinary skill in the art would recognize that flour comprises mostly starch and is insoluble in water. Moreover, Maat fails to disclose a composition comprising arabinoxylan ferulate. Since each and every claim term is not contained in either Maat or Geissman, claims 1-4, 6-23 and 27-29 are not anticipated. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. §102 be reconsidered and withdrawn.

***The claims are not obvious in view of the prior art***

Claims 1-14, 16-23 and 27-29 were rejected under 35 U.S.C. §103(a) as being obvious over Maat in view of Geissman for the reasons stated on page 6-7 of the Office Action. Applicants respectfully traverse.

At the outset, Applicants note the Examiner must show all of the recited claim elements in the combination of references that make up the rejection. When combining references to make out a *prima facie* case of obviousness, the Examiner is obliged to show by citation to specific evidence in the cited references that (i) there was a suggestion to make the combination and (ii) there was a reasonable expectation that the combination would succeed. Both the suggestion and reasonable expectation must be found within the prior art, and not be gleaned from applicants' disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re*

*Dow Chemical Co.*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988); *see also* MPEP §§ 2142-43 (Rev. 1, February 2000).

When an Examiner alleges a *prima facie* case of obviousness, such an allegation can be overcome by showing that (i) there are elements not contained in the references or within the general skill in the art, (ii) the combination is improper (for example, there is a teaching away or no reasonable expectation of success) and/or (iii) objective indicia of patentability exist (for example, unexpected results). *See U.S. v. Adams*, 383 U.S. 39, 51-52 (1966); *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d 1923, 1927 (Fed. Cir. 1990); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve*, 230 USPQ 416, 419-20 (Fed. Cir. 1986).

As discussed above, Maat does not disclose or suggest a composition comprising arabinoxylan ferulate that is neither water soluble nor non-cellulosic and non-starch. To the contrary, the present invention is directed to water soluble hemicellulose material comprising non-cellulosic, non-starch plant polysaccharide, wherein the polysaccharide comprises arabinoxylan ferulate; an oxidase and an oxidase substrate.

Further, Maat discloses the use of a combination of enzymes with flour to improve dough characteristics. A peroxidase is added to counter the effects of cellulose and xylanase (See, e.g., Maat, claim 1) and glucose oxidase and glucose are optionally added to further improve the *rheological* properties of the dough (See, e.g., Maat, claims 2-4), a known effect of these ingredients (See, e.g., Maat at column 1, line 66 to column 2, line 7). Indeed, Maat discloses an enzyme cocktail that is for a different purpose and that is used on a different material from that of the present invention. Moreover, the enzyme cocktail would not even induce the gelling effect of the present invention.

Geissman discloses gelling of wheat flour by hydrogen peroxide and peroxidase. In contrast, Maat is directed to the improvement of rheological properties of bread dough. Applicants respectfully submit that one of ordinary skill in the art would not be motivated to combine the teachings Maat and Geissman, much less have a reasonable expectation of success, because each disclosure is directed to different aspects of modifying properties of flour.

Claims 1-29 were rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,530,112 to Greenshields *et al.* ("Greenshields") in view of U.S. Patent No. 5,200,338 to Crawford *et al.* ("Crawford") for the reasons stated on pages 7-9 of the Office Action. Applicants respectfully traverse this rejection.

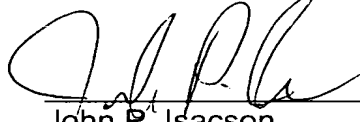
Greenshields disclose the extraction of hemicelluloses, which can be gelled using exogenous hydrogen peroxide. In contrast, Crawford discloses that by adding glucose and glucose oxidase, sufficient hydrogen peroxide would be generated *in situ* to degrade lignocellulose via the action of lignan peroxidase. Applicants respectfully submit that one of ordinary skill in the art would not be motivated to combine the teachings Greenshields and Crawford, much less have a reasonable expectation of success, because each disclosure is directed to different processes, gelling and degradation.

For any of the above reasons, Applicants respectfully submit that the claims are not obvious and request reconsideration and withdrawal of the rejections under 35 U.S.C. §103.

***Request***

Applicants submit that the claims are in condition for allowance, and respectfully request favorable consideration to that effect. The Examiner is invited to contact the undersigned at (202) 912-2000 should there be any questions.

Respectfully submitted,

  
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**MARKED-UP COPY OF AMENDED CLAIMS**

1. (Amended) **[A hemicellulosic material comprising an oxidase (e.g. glucose oxidase supplement)] A hemicellulose material comprising a non-cellulosic, non-starch plant polysaccharide, an oxidase and an oxidase substrate, wherein the polysaccharide comprises arabinoxylan ferulate and the hemocellulosic material is water soluble.**

2. (Amended) The material of claim 1 further comprising a peroxidase [(e.g. horse radish peroxidase) supplement and/or an oxidase substrate (e.g. glucose supplement)].

3. (Amended) The material of claim 1, **[or claim 2]** wherein the hemicellulose material is derived from cereal **[flour]**, husk or bran, **straw**, or from legumes **[(e.g., from maize, wheat, barley, rice, oats or malt)]**.

7. The material of **[any one of the preceding claims]** **claim 1, wherein said material is** in the form of a powder[, for example a substantially anhydrous powder and optionally a dispersant (e.g. glucose or maltodextrin)].

8. (Amended) The material of claim 7 **[which comprises oxidase, oxidase substrate (e.g. glucose) and optionally] which further comprises** peroxidase **[supplements]**, the material being self-gelling on the addition of water.

9. (Amended) The material of **[any one of claims 1-8]** **claim 1, wherein the material is** in the form of an aqueous solution.

10. (Amended) The material of claim 9, which is substantially **[oxygen free] free of molecular oxygen**.

11. (Amended) The material of claim 10, which **further** comprises **[oxidase, oxidase substrate (e.g. glucose) and optionally]** peroxidase **[supplements]** and which is self-gelling on exposure to **molecular** oxygen.



12. (Amended) A gel or viscous medium comprising the material of **[any one of claims 1-11]** **claim 1**, which has been oxidatively gelled.

13. (Amended) The gel of claim 12, wherein the material comprises **[(or consists essentially of)]** cross linked arabinoxylan **ferulate**.

14. (Amended) The gel of viscous medium of claim 12 **[or 13]** in dehydrated form.

16. (Amended) A process for preparing a gel or viscous medium comprising the step of oxidatively gelling the material of **[any one of claims 1-11]** **claim 1**, **[for example by adding water to the material of claim 8 or by exposing the material of any one of claim 9-11]**.

17. (Amended) A process for effecting oxidative gelatin of a **water soluble** hemicellulosic material, **said material comprising non-cellulosic, non-starch plant polysaccharides comprising arabinoxylan ferulate**, comprising **[the step of]** promoting the generation of hydrogen peroxide *in situ* by redox enzymes, **said generation comprising the steps of:**

- (a) providing oxygen to the material and/or
- (b) providing water to the material; and/or
- (c) providing oxidase substrate to the material; and/or
- (d) activating one or more of the redox enzymes.

18. (Amended) The process of claim 16, wherein the redox enzymes comprise an oxidase **[(e.g. glucose oxidase)]** and a peroxidase **[(e.g. horse radish peroxidase)]**.

19. (Amended) The process of claim 17 **[or 18]**, wherein the process comprises the steps of supplementing **[a]** **the** hemicellulosic material with an oxidase and optionally an oxidase substrate and/or a peroxidase.

20. (Amended) The process of **[any one of claims 17-19] claim 18**, wherein the generation of hydrogen peroxide is promoted by:

- (a) providing oxygen to the material **[(e.g. by generation or release *in situ*);]** and/or
- (b) providing water to the material; and/or
- (c) providing oxidase substrate to the material **[(e.g. by generation or release *in situ*);]** and/or
- (d) activating one or more of the redox enzymes **[(e.g. chemically or physically),**

**wherein the provision of oxygen or substrate may be by controlled release or generation *in situ*, for example by triggered generation or release by heat, irradiation or chemical treatment(s)].**

21. (Amended) A gel or viscous medium produced by **[(or obtainable by)]** the process of **[any one of claim 16-20] claim 16**.

22. (Amended) A process for producing **[a] the** hemicellulosic material **[(for example a material according to any one of claim 1-11)] of claim 1** comprising the step of supplementing a hemicellulose with an oxidase **[(e.g. glucose oxidase)]** and optionally a peroxidase **[(e.g. horse radish peroxidase) supplement]**.

23. (Amended) A material produced by **[(or obtainable by)]** the process of claim 22.

24. (Amended) A pharmaceutical or cosmetic preparation or medical device comprising the material, gel, viscous medium, dehydrated gel/viscous medium of **[any one of the preceding claims] claim 1**, the preparation or device being **[for example] selected [from:] from the group consisting of** a wound plug, wound dressing, controlled release device, an encapsulated medicament or drug, a lotion, cream, suppository, pessary, spray, artificial skin, protective membrane, a neutraceutical, prosthetic, orthopaedic, ocular insert, injectant, lubricant or cell implant matrix, optionally further comprising an antibiotic, analgesic **[and/or] and**

antiinflammatory agent.

25. (Amended) The material, gel or viscous medium of [any one of the preceding claim] **claim 12** for use in therapy, prophylaxis or diagnosis[, **for example in the treatment**] of skin **or membrane** lesions [(e.g. burns, abrasions or ulcers)].

26. (Amended) A wound dressing comprising the material of claim 11[, **for example in the form of a spray**].

28. (Amended) A foodstuff, dietary **[fibre] fiber** source, food ingredient, additive, lubricant, supplement or dressing comprising the material, **gel or viscous medium of claim 1**, [of any one of claims, the gel or viscous medium of any one of claims, for example] being selected from **the group consisting of** a petfood [(wherein the gel e.g. acts as a binder)], a flavour delivery agent, a canning gel, fat replacer [(e.g. comprising macerated gel of any one of the preceding claims)], a coating, a glaze, a bait **[or] and** a gelatin replacer.

29. (Amended) A masking agent comprising the gel of [any one of the preceding claims for example for use in masking semiconductor wafers, etching plates or surfaces to be painted] **claim 12**.